

2-3: The Fundamental Theorem of Variation

Warm-up:

1. Each side of a square patio is 8 feet long. Matt Mitarnowski plans to increase the size of the patio by increasing the length of each side by 50%. How will the area of the enlarged patio compare with the area of the original?

2. The length of each edge of a cube is 9 in. How does the volume of a cube with edges 3 times as long compare with the volume of the smaller cube?

Example 1: The area of a circle is given by $A = \pi r^2$.

a. Complete the following table in terms of π .

r	1	2	3	4	5	6	7
A	π						

b. Now complete a second table, doubling the radii in the above table.

r							
A							

c. How do the areas of the new table compare with the areas of the first? Do you notice a pattern?

Fundamental Theorem of Variation:

Example 2: $I = \frac{k}{D^2}$ tells that the intensity of light varies inversely as the square of the distance from the light source. What effect does doubling the distance have on the intensity of the light?

Example 3: Suppose that in a variation problem the value of x is doubled. What is the effect on y if:

a. y varies directly as x .

b. y varies directly as x^2

c. y varies inversely as x

d. y varies inversely as x^2

Homework:

"The difference between a successful person and others is not a lack of strength, not a lack of knowledge, but rather a lack in will." - Vince Lombardi